X

PROGRESS REPORT

OF

THE FOREST SURVEY BRANCH

FOR

1890-91.

1892.

No. 577-F., dated Simla, the 17th May 1892.

From—SIR E C. BUCK, KT., Secretary to the Government of India, Revenue and Agricultural Department,

To—The Surveyor General of India.

I am directed to acknowledge the receipt of your letter No. 196-S., dated the 16th January last, forwarding, with your remarks thereon, the Annual Progress Report of the Forest Survey Branch for the year 1890-91, submitted to you by Mr. W. H. Reynolds, Superintendent of Forest-Surveys, who was in charge of the Branch during the year.

2. The record of the year's operations is one of steady expansion and improvement, and the Government of India fully endorse the remarks contained in para. 10 of your letter, commending Mr. Reynolds for his successful administration of the Branch during the year. It is also satisfactory to observe, with reference to this Department letter No. 469-F., dated the 22nd April 1891, to your address, that the conduct of the establishment under the Superintendent's orders gave rise to no complaints. The Government of India concur in the remarks contained in your letter under reply, in which you have commented fully upon the field and other operations conducted by the Branch during the year.

No. 578-F.

COPY forwarded to the Inspector General of Forests for information.

G. C. Press, Simla.—No. 98 R. & A D.—23 5-92.—175.

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PROGRESS REPORT OF THE FOREST SURVEY BRANCH FOR 1890-91.

No. 196 S., dated Calcutta, the 16th January 1892.

From—COLONEL H. R. THUILLIER, R.E., *Surveyor General of India,*

To—*The Secretary to the Government of India,* REVENUE AND AGRICULTURAL DEPT.

I HAVE the honour to forward the Annual Progress Report of the Forest Survey Branch for the year 1890-91 submitted by Mr. W. H. Reynolds, Superintendent of Forest Surveys, under whom the operations have been carried out.

2. The principal operations were in continuation of those of last year, *viz.*, in Bashahr, Punjab, in the Jubbulpore, Raipur and Bhandara districts of the Central Provinces, in district Goalpara, Assam, and in the Dolmar-Morar Forests in the North-Western Provinces and Oudh, the survey of which was completed. The only work newly instituted during the year was the survey of the forests in the Tenasserim Circle of Lower Burma, which was commenced in December 1890.

3. The general outturn of field and office work for the year is given in Appendices A and B of Mr. Reynolds' report.

The total area topographically surveyed amounts to 1,381 square miles, of which 108 square miles of forest survey were mapped on the scale of 16 inches to the mile, 820 square miles on the 4-inch scale, and 453 square miles on the 1-inch. This outturn exceeds that of last year by 351 square miles, and the increase may be assigned chiefly to more favaurable conditions of climate which enabled the field work to be carried on longer than usual, and to the country operated in being comparatively easy, as well as to the improved efficiency of the European Assistants in supervising and managing the native surveyors. A statement of the classes of areas surveyed is given in Appendix D.

The area triangulated nearly trebles that of last year, being 2,827 against 987 square miles. This satisfactory result is chiefly due to the employment of two additional assistants on this branch of the work. In addition 281 linear miles of traversing covering an area of 246 square miles were run with theodolite and chain. The greater part of this preliminary work is in advance of the area surveyed in detail.

4. It is satisfactory to observe that with regard to the survey of the forests in the Goalpara District, Assam, the failure in the last year's operations has been practically compensated for. Though valuable time was lost in the commencement of the field season of 1890-91 in completing the preliminary operations which should have been done in the previous year by strengthening the detail surveyors, the topographical work, when once started, was energetically pushed on, and the late setting in of the rains enabled the field work to be continued later than usual, so that a satisfactory outturn has been effected.

5. The detail surveys (with the exception of that done in Assam) were checked as usual by the European Assistants, and in addition to the instrumental contours run through the work in high and broken ground, 110 linear miles of check surveys were run through the more open tracts. With the exception of a small area in Raipur, which had to be revised, the remainder of the work stood the tests applied.

A

6. The cost rates per square mile of the detail survey in Bashahr amount to R12-2-0 for the 1-inch scale and R62-1-0 for the 4-inch scale, exclusive of the cost of triangulation. These rates compare favourably with the corresponding rates for last year, which were R14-6-0 and R65-8-0, respectively. The cost rate of the triangulation done during the season was R8-3-0 per square mile.

In the Central Provinces, the average cost rate in the three districts of the 4-inch detail survey was R47-9-0. It is not clear from the report whether this rate includes the cost of the triangulation or not (probably not), but it includes the cost of the 16-inch survey of the boundary lines of the forests and of the classification of the forest growths and soils.

In Assam, the rate for the 4-inch detail survey, including the cost of classifying forest growth and soils, was R44 per square mile and the cost of the triangulation was R7-8-0 per square mile. The average rate of the traverse work done during this and the previous season was R31-5 per square mile.

In Burma only the preliminary work of triangulation and traversing was effected: the cost rates of these operations were R27-2-0 and R32-2-0, respectively; but as this was the first season of the operations and the physical difficulties to be overcome are very considerable, no comparison can be made with the rates of similar work in other parts.

7. Mr. Reynolds personally visited the various detachments in the field and inspected the work in progress. Early in December 1890, he proceeded to Burma and started the new operations there. He was in the Goalpara District from the 21st January to 9th February 1891, and thence proceeded to the Central Provinces, where he was engaged in inspecting the three detachments employed there till the beginning of March. The field work in Bashahr was under his immediate supervision, and he was with the detachment in the field from the end of April to the middle of August 1891.

8. The return of mapping executed in the year is given in Appendix B, and shows that satisfactory progress has been made in publishing the results of the survey.

9. I have to report that I inspected the Office of the Forest Survey Branch in October 1891 and carefully examined the records, field sheets, and mapping, which were all found in excellent order, and the arrangements and general organization of the office all that could be wished. The maps are prepared in an effective style, and the field sheets gave evidence of the survey having been executed with care.

10. The year's record of work is highly satisfactory, and I consider that Mr. Reynolds deserves credit for his successful labours.

11. The total expenditure for the year amounted to R1,10,164 against R91,553 in 1889-90 and R78,988 in 1888-89. The increase in the year under report is due to the new survey that has been taken up in Lower Burma. The increased grants of recent years have of course been the means of obtaining the increased outturns of work accomplished.

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ANNUAL PROGRESS REPORT

OF THE

FOREST SURVEY BRANCH OF THE FOREST DEPARTMENT,

FROM 1ST OCTOBER 1890 TO 30TH SEPTEMBER 1891.

BY

W. H. REYNOLDS, ESQ., F.R.G.S.,

SUPERINTENDENT OF FOREST SURVEYS.

THE operations of the Forest Survey Branch that are now reported on are for the period 1st October 1890 to 30th September 1891 or for the survey year 1890-91.

2. Mr. W. H. Reynolds, Superintendent of Forest Surveys, on return from furlough, on the 24th October 1890, resumed charge of his office from Mr. E. Litchfield, Assistant Superintendent, and directed and supervised the operations of the Forest Survey Branch throughout the year.

THE SEASON'S FIELD WORK.

Surveys completed or in progress.

3. In continuation of the previous season's operations, field work was conducted in Bashahr in the Punjab, in the districts of Jubbulpore, Raipur, and Bhandara in the Central Provinces, the district of Goalpara in Assam, and in the Dolmar-Morar forests in the Central Circle of the North-Western Provinces and Oudh.

4. The survey of the Dolmar-Morar forests, the demarcation of which was incomplete at the close of the previous field season, was completed during the year under report.

New surveys commenced during the year.

5. The survey of the forests in the Tenasserim Circle of Lower Burma was commenced in December 1890, under the orders communicated in Government of India letter No. 962 F., dated 22nd November 1890, and intimated to the Superintendent, Forest Surveys, in Inspector General of Forests' endorsement No. 895, dated 26th idem.

Duration of the field season.

6. The average duration of the field season was nearly six months for parties working in the Central Provinces, those working in the Himalayas were out for about seven months, and in Assam and Burma the duration of the field season was seven and four months, respectively.

The Central Provinces and Assam parties were in the field from November to late in June, in Burma the Surveyors were out from the end of December

to the beginning of April, and in the Himalayas they were out for two periods of five and two months immediately before and immediately after the cold weather.

Area topographically Surveyed.

7. The total area topographically surveyed on various scales was 1,381 square miles as against 1,029 in the previous year, *viz.* :—

On the	16-inch	scale,	108	square	miles.
„	4	„	820		„
„	1	„	453		„

Forest growth and soil tracings.

8. For the 4-inch areas surveyed in the Central Provinces, the usual tracings illustrating the distribution of forests and classification of soils were prepared, showing the distribution of forests and the density of growth.

Check Surveys.

9. To the areas topographically surveyed, the usual checks were applied by the European Assistants in charge of detachments by running instrumental contours through the work at prescribed vertical distances in mountainous or rugged country, and in addition to this 110 linear miles of check surveys were run through less broken tracts. With the exception of a small area in Raipur done by a comparative young hand, and which was rejected, the rest of the work stood the tests that were applied.

Triangulation and traversing.

10. Triangulation was extended over an area of 2,827 square miles as against 987 in the previous year, and 281 linear miles of traversing with theodolite and chain was run in an area of 246 square miles. The greater part of this work is in advance for the coming field season.

Comparison with previous year.

11. As compared with the previous year, the areas topographically surveyed as well as the area triangulated in advance is greatly in excess of the outturn for 1889-90. The large outturn of triangulation is chiefly due to two additional hands having been employed upon this branch of the work and several causes have tended to increase the outturn of topographical work, the chief of which were (1) the holding off of the monsoon which enabled the Surveyors to remain in the field later than usual, (2) the country under survey, particularly in the Central Provinces, was less rugged and comparatively easy, and farthermore (3) the junior European Assistants, who are comparatively young hands, had gained more experience in handling and managing their Native Surveyors.

Summary of outturn of field work and computations.

12. A summary of the outturn of field work and computations will be found in Appendix A, and in Appendix D is given a statement of the classes of areas surveyed.

EXPENDITURE FOR THE YEAR.

13. The total expenditure for the year incurred on surveys executed by the Forest Survey Branch in the several Provinces under the Government of India, as well as for other special work not connected with these surveys, was R1,10,164 against R91,553 in the previous year. The increase of expenditure is due to the new surveys that have been taken up in Lower Burma.

Expenditure under Provincial headings.

14. Appendix C exhibits the expenditure for the survey year (1st October 1890 to 30th September 1891) arranged under Provincial headings.

Cost-rate.

15. The cost-rates of the several Provincial surveys are recorded under headings of Provinces in which surveys were in progress, and under these headings is also given detailed information regarding each survey.

PUNJAB.

Bashahr survey.

16. The survey of the Bashahr State was resumed in continuation of the previous year's work. Topographical work on the 4-inch and 1-inch scales was carried on in the Pabar, Nogli, and Kailas forest ranges, and triangulation was extended in the Pandra Bis and Chini ranges. The topographical work as well as the triangulation was somewhat retarded owing to the unusual amount of rain which fell during August and September.

Area topographically surveyed.

17. The Topographical Surveyors were in the field from the 1st October to 27th November 1890, when they returned to head-quarters; they again took the field in the middle of April 1891 and remained out till the 24th September.

The total area topographically surveyed was 611 square miles against 500 square miles in the previous season; of this area, 158 square miles were on the 4-inch scale and 453 on the 1-inch scale. Instrumental contours, as usual, were run throughout the 4-inch work at vertical distances of 500 feet. The 1-inch areas were for the most part situated at elevations of over 12,000 feet above sea-level, and the surveyors employed upon this portion of the work were often obliged to undergo great hardships, owing to the trying nature of the climate at these high altitudes and the difficulties in procuring supplies in these remote regions.

Triangulation.

18. Triangulation was carried on from May to September, but very little progress was made after the 15th August owing to the unusually heavy rainfall and dense fogs in the higher hills. In the Pandra, Bis and Chini ranges triangulation was extended, in advance, over an area of 472 square miles against an area of 378 square miles in the previous year.

Supervision of field party.

19. The field work was conducted under the immediate supervision of Mr. W. H. Reynolds, Superintendent of Forest Surveys, who was with the field party from the end of April to the middle of August.

Index map showing progress.

20. An index map is attached as Enclosure No. 1, which illustrates the progress of the Bashahr survey.

Season's cost-rate.

Appendix C.

21. The total expenditure incurred on account of the Bashahr survey for the year under report was R19,286 against R17,461 in the previous year. The details are given in Appendix C.

Excluding the cost of the work done *in advance* of the detail survey, the cost of the season's topographical work estimated on the areas plane-tabled was:—

1-inch scale, R12-2 per square mile,
4 „ „ R62-1 „ „

against R14-6 and R65-8 for 1 and 4-inch work, respectively, in 1889-90. The cost-rate of the 4-inch work includes the cost of the preparation of a record of forest growth as well as the cost of a considerable amount of fair map-drawing of previous years.

The triangulation in advance (in an exceedingly difficult country like Bashahr and at an average elevation of from 12,000 to 18,000 feet) cost R8-3 per square mile.

Arrest of a Native Surveyor by Kuintal State.

22. In the early part of the field season one of the Native Surveyors working on the boundary of the Bashahr/Kuintal State was arrested by an official of the Kuintal State, together with his khallasees, and his surveying instruments taken from him. A report of this circumstance was made to the Deputy Commissioner of Simla in December 1890, but up to date the case has not been finally disposed of.

Central Provinces.

Central Provinces surveys

23. In the Central Provinces the Forest Survey Branch was employed in surveying the forest tracts in the districts of Jubbulpore, Raipur, and Bhandara in continuation of the operations of the previous year, and the fair mapping was done of the Ahri forests in the Chanda district, the survey of which was completed in the previous year.

Surveys completed and new surveys instituted.

24. The survey of the forests in the Jubbulpore district was completed during the year under report, and the party employed in this district will, during the coming field season, take up the survey of the Dhanwai forest range in the Mandla district in accordance with the orders in the Chief Commissioner's letter No. $\frac{6900}{474}$, dated 29th September 1891, and forwarded to the Superintendent, Forest Surveys, under Inspector General of Forests' endorsement No. 828, dated 16th October 1891.

Total expenditure and average cost of surveys in the Central Provinces.

25. The total expenditure incurred by the Forest Survey Branch for surveys in the districts of Jubbulpore, Raipur, and Bhandara, including a small expenditure for the Chanda mapping, was R28,290, the details of which are given in Appendix C. The total area topographically surveyed was 591 square miles, and the average cost of the entire season's work, including the 16-inch boundary surveys and the preparation of the soil and forest distribution records, was R47-9 per square mile.

Summary of field and office work.

26. A summary of the season's field work will be found in Appendix A, and in Appendix B is given a summary of the original drawings under preparation during the year.

Jubbulpore District.

Jubbulpore surveys.

27. Mr. T. S. Marten with the Jubbulpore survey detachment left Dehra on the 11th November, and field work was commenced on the 15th idem. Field operations were confined to the northern part of the district, chiefly in the pergunnahs Sleemabad and Bijeraghogarh, and owing to the holding off of the monsoon and the season being a comparatively healthy one, the Surveyors were enabled to remain in the field longer than usual; the party returned to recess quarters on the 8th June.

28. An area of 138 square miles against 125 square miles in the previous year, was surveyed on the 4-inch scale, and 455 linear miles of forest boundary with strips of topography on both sides of the boundary line, aggregating 57 square miles, were surveyed on the 16-inch scale, making in all a total area of 195 square miles of topographical work.

Area topographically surveyed.

Along 25 miles of forest boundary the numbering of the pillars was added to field sheets of the previous year.

29. An index map of the Jubbulpore district is attached hereto as "Enclosure No. 2," which illustrates the areas surveyed up to 1889-90 as well as the areas surveyed during 1890-91.

Index map illustrating progress of survey.

30. For all forests under survey a record was prepared, illustrating the distribution of forests and the classification of soils.

Distribution of forests and soil tracings.

31. The topographical work was tested in the usual way by running instrumental contours at prescribed vertical distances, and 13 miles of check surveys were also run as well as one mile of levels. The work is reported to have stood the test.

Tests applied to work.

32. The 16-inch boundary sheets for all forests in the district have been completed and finally compared with the settlement plans on a similar scale. These sheets will form a valuable boundary record, and will greatly facilitate the adjustment of any boundary disputes that may arise hereafter.

Comparison of 16-inch boundary sheets with settlement plans.

33. Mr. W. H. Reynolds, Superintendent of Forest Surveys, was in the Jubbulpore district from the 11th to the 19th February, and satisfied himself that the field work was being efficiently conducted.

Superintendent's inspection.

34. The cost of the field and office work for the year was R7,106, and the total expenditure incurred on account of forest surveys in the Jubbulpore district was R9,462: the details are given in Appendix C.

Cost.

The cost of the season's work estimated on the area plane-tabled was R48-6 per square mile as compared with R58-8 in the previous year; these figures include the cost of the 16-inch boundary survey and the preparation of the record of forest distribution and classification of soils.

35. The survey of the forests in the Jubbulpore district is now completed, but for administrative purposes, the Dhanwai range in the Mandla district has been added to the Jubbulpore Forest Division, and orders have been received to complete the survey of this forest range in continuation of the survey of the forests in the Jubbulpore district. This work will be taken up during the field season of 1891-92.

Completion of survey and future programme.

Raipur District.

36. The Raipur party under Mr. James Marten left Dehra on the 30th November and commenced field work on the 21st December. The season's operations were confined entirely to the Sahawa pergunnah, and, owing to the monsoon having held off, the Surveyors were able to remain out longer than

Raipur surveys.

usual. The Sahawa forests are notoriously unhealthy during the early months of the cold weather, and little or no progress can then be made with survey work; and as the hot weather in these forests is the most healthy time of the year, the Surveyors were kept in the field to as late a date as possible; the party returned to recess quarters towards the end of July.

Area topographically surveyed.

37. An area of 222 square miles was topographically surveyed, of which 193 square miles is on the 4-inch scale and 29 square miles on the 16-inch scale, and 231 linear miles of forest boundaries were also surveyed on the 16-inch scale.

An index map of the Raipur district is attached as "Enclosure No. 3," which illustrates the progress of the survey, and the details of the work are given in Appendix A.

Forest growth and soil tracings.

38. The usual tracings detailing the density of forest growth and classification of soils were prepared for all forest areas dealt with.

Tests applied to the work.

39. The topography was checked as usual by running instrumental contours throughout the work, and 79 linear miles of "partal" or check surveys were run across the less broken and open country. A small area done by a comparatively new hand had to be revised.

One hundred and two sheets of forest boundaries on the 16-inch scale were checked with the settlement maps.

Superintendent's inspection.

40. The Superintendent of Forest Surveys was in the Raipur district early in March, and satisfied himself that the field work was being efficiently conducted.

Cost.

41. The expenditure on account of field and office work was R5,966, and the total expenditure for the year on account of the Raipur Forest Survey, including all charges, was R9,289.

The cost of the season's work estimated on the area topographically surveyed, and including the 16-inch boundary surveys, was R41-9 as compared with R50 in the previous year and R54-6 in 1888-89.

Bhandara District.

Bhandara surveys.

42. The survey of the forests in the Bhandara district, which was commenced in 1889-90, was continued. The party under Mr. C. Litchfield took the field in the middle of November, and out-door work was continued till the 21st April.

Field operations were confined to the forests in the Bhandara and Partabgarh pergunnas.

Area triangulated and topograpically surveyed.

43. The area plane-tabled or topographically surveyed was 174 square miles, of which 152 square miles were done on the 4-inch scale and 22 are on the 16-inch scale; 300 linear miles of forest boundaries were completed on the 16-inch scale.

Triangulation was extended over an area of 615 square miles, and is well in advance of the topographical survey.

An index map of the Bhandara district, illustrating the progress of the work, is attached hereto as "Enclosure No. 4."

44. At the same time as the topographical survey progressed, a record was prepared of the distribution of forests and the classification of soils, similar to the documents that were prepared for the rest of the forests in other districts that are under survey.

Forest and soil records.

45. The topographical work was checked by running instrumental contours at prescribed vertical distances, and 18 linear miles of check or *partal* lines were run through the area surveyed. It is reported that the work stood the tests that were applied and no revisions were necessary.

Tests applied.

The 16-inch boundary sheets have not yet been compared with the settlement records, as the settlement papers were not sufficiently advanced for this purpose.

46. The Superintendent of Forest Surveys was in the Bhandara district from the 22nd February to 1st March, and was satisfied that the triangulation and other field work of this party was being efficiently carried on.

Superintendent's inspection.

47. The cost of the field and office work for the season was R6,366, and the total expenditure for the year, including all charges, was R9,103.

Cost.

The cost of the 4-inch topographical work, including the 16-inch boundary surveys and preparation of records of forest distribution and classification of soils, was R39 per square mile against R42-4 in the previous season.

The season's triangulation cost R3-8 per square mile.

North-Western Provinces.

48. With the exception of some boundary surveys in the Dolmar-Morar forests of the Central Circle, no field work was undertaken in the North-Western Provinces, but an expenditure of R522 was incurred as follows, chiefly on account of map-drawing or for printing and publishing original maps:—

North-Western Provinces surveys.

	R
Central Circle	162
School "	360

Assam.

49. The survey of the sâl forests in the Goalpara district was resumed in continuation of the operations of the previous year. Mr. E. Litchfield, with a small detachment of Native Surveyors, left Dehra early in November for the purpose of pushing on the preliminary work of triangulation and the connection of the traversing with the triangulation which ought to have been done during the previous year; on the 30th November he was joined by Mr. Kelly, who was deputed from the Local Forest Department to assist in survey work.

Goalpara surveys.

As soon as the preliminary work was sufficiently advanced, the party was strengthened in February by another detachment of plane-tables and computors, and the topographical work was then pushed on vigorously.

Owing to the late date on which the regular monsoon set in in Assam, the party was enabled to remain in the field till the 7th June.

Mr. E. Litchfield, Assistant Superintendent of Forest Surveys, was in charge of the Goalpara party throughout the field season.

50. An area of 180 square miles was topographically surveyd on the 4-inch scale, and a record of the distribution of the forests and the classification of soils was also prepared for this area.

Area topographically surveyed.

51. Triangulation was extended over an area of 1,106 square miles, and the position of most of the pillars on the Bhutan boundary, from No. 50 to No. 66, were determined by trigonometrical fixings. The area traversed was 61 square miles.

Area triangulated and traversed.

The preliminary work of triangulation and traversing is sufficiently in advance for the coming field season's plane-tabling.

An index map of the Goalpara district is attached as "Enclosure No. 5," illustrating the progress of the Goalpara Forest Survey.

52. To the topographical work no tests have as yet been applied as Mr. E. Litchfield's time was fully employed in pushing on the triangulation and in bringing up the traverse computations of the previous season. The usual tests, however, will be applied during the coming field season before the work is finally passed.

Tests applied to work.

53. Mr. W. H. Reynolds, Superintendent of Forest Surveys, was in the Goalpara district from the 21st January to 9th February, and inspected and scrutinized the work that was in progress.

Superintendent's visit to field party.

54. Rupees 13,645 were expended on field and office work, and the total expenditure for the year, including all charges, was R21,186.

Cost.

Taking the area traversed in 1889-90 with that traversed during the present year, against the expenditure on traversing during these two years, the average cost rate for traversing is R31-5 per square mile. The traversing of the previous season was incomplete at the close of the year, inasmuch as the computations were not done and had to be brought up during the year under report.

The topographical work on the 4-inch scale, including the preparation of the records of distribution of forests and the classification of soil, cost R44 per square mile, and the triangulation cost R7-8 per square mile.

BURMA.

55. The survey of the reserved forests in the Tenasserim Circle of Lower Burma was sanctioned in Government of India letter No. 962 F., dated 22nd November 1890, from the Under-Secretary in the Revenue and Agricultural Department, to the Chief Commissioner of Burma.

Orders regarding the survey.

56. Accordingly a survey detachment was at once organized at Dehra Dun to take up the preliminary work of triangulation and traversing. The party proceeded to Moulmein early in December with Mr. W. H. Reynolds, Superintendent of Forest Surveys, and commenced field operations in the Thoungyin forests, on the Siam frontier, before the end of the same month. The Surveyors were in the field up to the 2nd April, when they returned to recess quarters on completing the season's programme of work, and when it was no longer possible to continue triangulation, owing to the hazy state of the atmosphere.

Survey of forests in Salween division.

57. In December 1890 the services of Mr. Hauxwell, Deputy Conservator of Forests, were placed at the disposal of the Superintendent of Forest Surveys by the Burma Government, and after the field work was fairly started, this officer, on Mr. Reynolds' departure from Burma, remained in charge of the party, and supervised the work until the close of the field season.

Officer in charge of party.

58. Triangulation was extended over an area of 209 square miles, and an area of 185 square miles was traversed with theodolite and chain. The traversing followed the outer forest boundaries, and several cross lines were run through the interior of the forest blocks.

Area triangulated and traversed.

The computations of the triangulation and traversing were done at the Head-Quarters Office at Dehra Dun.

An index map is attached as "Enclosure No. 6," illustrating the area dealt with.

59. On completion of the traverse survey, the Divisional Forest Officer undertook to put down, on all outer boundaries, four permanent pillars to the mile. These pillars are to be built over traverse stations, and will answer the double purpose of permanent boundary marks as well as survey stations, and by this means will be secured, as the survey progresses, the permanent demarcation of the reserved forests.

Permanent marking of traverse station and demarcation of forests.

60. The cost of field and office work for the season was R3,539, and the total expenditure for the year, including all charges, was R11,471.

Cost.

The triangulation cost R27-2, and the traversing cost R32-2, per square mile. As this is the first season in which operations by the Forest Survey Branch have been carried on in Burma, no comparison can be drawn with similar work of previous years; but considering the difficult nature of the country and the many difficulties to be overcome, particularly in the way of transport and obtaining supplies, these figures are considered satisfactory.

61. Much credit is due to Mr. Hauxwell for the able manner in which he kept the several camps supplied with provisions and coolie labour, and this in a measure greatly contributed to the successful results of the season's operations, as the Surveyors were thus enabled to push on their field work uninterruptedly.

62. It was not found possible to enlist the services of Burmans for survey work, as none were found who could use a theodolite, and any who might be taught would not work for the salaries paid to men recruited in India. Shan coolies were freely employed on the work as khallasees and did well, but they had to be paid high wages compared with the labour brought across from India.

Local Surveyors.

63. Before Mr. Reynolds returned from Burma, he and Major Bingham, the Conservator of Forests, Tenasserim Circle, drew up a "Joint Memorandum," or plan of operations for the survey of the forests in the Tenasserim Circle, and the Chief Commissioner approved generally of the arrangements made.

Joint memorandum by Mr. Reynolds and Major Bingham.

In this memorandum it was stated that the detailed survey of the forests would be on the scale of 4-inch = 1 mile, and as the country was covered with dense forests and often with impenetrable undergrowth, it would not be possible to show all details applicable to the scale, hence the minor topographical

features would be more or less generalized, and the scale of the topographical survey be a *modified* one of 4-inch = 1 mile.

Assistance rendered by Major Bingham.

64. The Superintendent of Forest Surveys has much pleasure in acknowledging the ready and valuable assistance afforded to the Forest Survey Branch by Major Bingham, the Conservator of Forests, Tenasserin Circle, and the satisfactory results of the season's operations are in a great measure due to his hearty co-operation and interest he took in the survey work.

BERAR.

Provincial boundary.

65. The Provincial boundary between Berar and the Central Provinces touching on the Nimar district, was finally demarcated by the local authorities with permanent pillars, and was mapped by the Forest Survey Branch during the year under report.

Expenditure.

66. The amount expended during the year on account of Berar was R1,816, which was chiefly on account of mapping and printing and publishing of standard sheets.

BENGAL.

Singbhoom forests.

67. The southern boundary of the Singbhoom forests has not yet been reported as being ready for survey, hence the balance of the 4-inch boundary sheets for these forests cannot be got out of hand.

Expenditure.

68. An expenditure of R1,080 was incurred during the year, chiefly on account of printing and publishing sheets of the Singbhoom survey.

OFFICE WORK.

Computations.

69. In Appendix A will be found an abstract of the outturn of the season's computations. The number of triangles computed in duplicate was 1,087, and the rectangular co-ordinates of 559 trigonometrical stations and of 4,307 traverse stations were deduced; to determine the heights above sea-level of 376 stations, 791 triangles were computed. The latitudinal and longitudinal values of 358 stations of the Great Trigonometrical Survey were converted into rectangular co-ordinates; from 4,856 observations with the tangent scale clinometer, the heights above sea-level of 2,135 points were computed, and abstracts were prepared from triangulation field-books of 3,643 horizontal angles; 54 stations of the Revenue Survey were converted to Forest Survey co-ordinate values.

All the above computations were worked in duplicate.

Areas.

70. The final areas of 176 reserved forests situated in 67 standard sheets of various Provinces were deduced.

MAP-DRAWING.

Appendix B.

71. A summary of the original drawings under preparation or published during the year, as well as other miscellaneous office work executed by the Forest Survey Branch, is given in Appendix B.

North-Western Provinces and Oudh.

72. A second edition has been prepared of four standard sheets of the Kumaun and Garhwal 4-inch forest map, and two new sheets on a similar scale and containing parts of the recently reserved forests in the neighbourhood of Naini Tal have been drawn; of these six sheets, one has been published, four are in the press, and one is in progress. Also a map on the ¼ inch scale has been published of the reserved and protected forests of the Ganges, Garhwal, Naini Tal, and Kumaun divisions.

Central Circle.

For the School Circle a map of the Korwa forest on the 12-inch scale was published, and five standard sheets on the 4-inch scale containing the Karamba forest and the leased forests of Tehri Garhwal, have gone to the press, and one sheet is in progress.

School Circle.

A map of the reserved forests in districts Kheri and Pilibhit, on the scale of 1-inch = 4 miles, was published for the Oudh Circle.

Oudh Circle.

Punjab.

73. For the Punjab, one standard sheet of the Bashahr survey on the 4-inch scale has passed through the press, 12 sheets are in the press, and 15 sheets are in progress. A map in two sheets of part of the Chamba territory showing leased forests, on the scale of 1-inch = 2 miles, as well as a map of the leased forests of Banikhet, Surkhigalli, Dadra, and Kalatop, on similar scale, have passed through the press.

Four charts of triangulation of the Bashahr State on the scale of 1-inch = 1 mile are in progress.

Assam.

74. A map on the scale of 1-inch = 4 miles of the Darugiri reserve in the Garo Hills division of Assam has been sent to press, and an index map to the forest survey of district Goalpara on the ¼-inch scale, has been published.

Bengal.

75. Of the Bengal standard maps on the 4-inch scale reported as having been in progress last year, 13 have been published during the year under report.

Berar.

76. Ten standard sheets of the Melghat survey on the scale of 4-inches = 1 mile have been published, and ten of the 4-inch sheets were reproduced on the 2-inch scale. This completes the Melghat series of maps.

Central Provinces.

77. Of the 4-inch standard maps of the Central Provinces, 11 sheets of the Jubbulpore district have been sent to press, and 7 others are in progress.

Six sects of the Raipur district as well as six standard sheets of the forest in the Bhandara district and six of Chanda, are also in progress.

An index map to the forest survey of district Bhandara, drawn on the 1-inch = 4 miles scale, has been published to ½ scale.

Burma: Pegu Circle.

78. For the Pegu Circle of Lower Burma 9 maps of various reserved forests on the 1-inch scale were published.

Tenasserim Circle.

For the Tenasserim Circle an index map of the forest surveys of the East and West Salween divisions and part of Attaram, on the scale of 1 inch = 8 miles, has been published.

Upper Burma.

For Upper Burma a map of the Sareikta, Nankyita, and Nambyan forests, in the districts of Ye-u and Wuntho, on the scale of 1 inch = 1 mile, has been published, and maps on a similar scale of the reserved forests of Taungdwin, parts of Mingin, Kani, and Se-yawgyaung, have passed through the press, as well as a map of the Kindat reserve in the Chindwin division on the scale of 1 inch = 1 mile. Maps of the Nwamadaung and the Min West proposed reserves are in the press, and a map in two sections, on the 1-inch scale, of the forests in the Minbu division of Upper Burma, is in progress.

Tracings and other miscellaneous work.

79. For various Forest and District officers 127 tracings were prepared, 921 maps were cut up and mounted in book form, and 1,345 printed maps were coloured.

Provincial Map Records.

80. Considerable progress has been made in posting up forest information in the provincial map records. The keeping of these records, posted to date, is a most labourious task, and requires the constant attention of a skilled assistant. The work is in Mr. Descube's hands, and he executes it most creditably.

Detailed lists of best available forest maps.

81. The detailed lists of the best available maps of the reserved, protected and unclassed forests continue to undergo constant revision, as new maps are published, and made available from time to time for the Forest Department.

All forests that have been gazetted up to date in all the Provinces under the Government of India (except the Punjab), as well as in the Madras Presidency, as "reserved" or "protected," have been located on the best available maps, but considerable difficulty is experienced in dealing with the map records for the Bombay Presidency, as the Superintendent of Forest Surveys is not in direct communication with the Bombay Conservators.

During the year under report forest information has been added to 188 published maps, and 559 reserved and protected forests have been added to existing maps.

Forest map of India.

82. It has been ordered that a revised edition of the forest map of India is to be published every five years, the year up to which the corrections and additions are worked coinciding with that in which the quinquennial *résumé* of forest administration by the Inspector General of Forests is issued. The next publication will, therefore, be issued in 1893-94.

Officers of the Superior Staff.

Mr W. H. Reynolds, Superintendent of Forest Surveys.

83. Mr. W. H. Reynolds, Superintendent of Forest Surveys, assumed charge of his office on return from furlough on the 24th October 1890, and continued to control and direct the operations of the Forest Survey Branch to the close of the year under report. His name was transferred to the graded list of officers of the Survey of India Department by Government of India (Revenue and Agricultural Department), No. $\frac{1056}{52-11}$S. (Surveys), dated 1st October 1890.

Mr. Reynolds left Dehra on 7th December 1890, and proceeded to Moulmein to start the survey of the forests of the Tenasserin Circle of Lower Burma; he was with the Burma party up to the middle of January, and when the work

was fairly started, he proceeded to Assam, and was with the Goalpara detachment from the 21st January to 9th February. From the 11th to 19th of February he was with the Jubbulpore party, after which he proceeded to Bhandara, and was with the survey detachment in that district from the 22nd February to the 1st March; he then visited the party working in the Raipur district and was there up to the 7th March, when he proceeded to Dehra Dun for the purpose of examining in surveying the student at the Forest School. From the 14th March to the 26th April Mr. Reynolds was at head-quarters, and from the 28th April to the 13th August he was with the Bashahr party, supervising and directing the survey work in the Himalayas; he then returned to Dehra Dun and remained at head-quarters till the close of the year.

Mr. E. Litchfield, Assistant Superintendent, Forest Surveys.

84. Mr. E. Litchfield held charge of the Office of Superintendent, Forest Surveys, from the 1st to the 24th October 1890, and after being relieved by the Superintendent he proceeded to Assam on the 3rd November and assumed charge of the Forest Survey party working in the Goalpara district. He was in the field up to the 14th June and then returned to head-quarters.

On the 1st July he proceeded on three months' privilege leave and returned to duty on the 1st October. In addition to supervising the field work of the Goalpara party he completed all the triangulation that was necessary for the season's plane-tabling and traversing of this detachment, and computed some of the traversing which, properly speaking, ought to have been got out of hand in the previous year. Hence as his time was so fully employed upon other branches of the work, he was unable, before the close of the field season, to examine and test the season's plane-tabling. This however, will be done during the coming field season.

Mr. E. Litchfield's name was transferred from the Forest list to the list of officers of the Survey of India Department, in Government of India (Revenue and Agricultural Department), No. $\frac{1056}{52-11}$S. (Surveys), dated 1st October 1890, but he continues to remain on deputation to the Forest Department as Assistant Superintendent of Forest Surveys.

Mr. T. A. Hauxwell, Deputy Conservator of Forests.

85. The services of Mr. Hauxwell, a Forest officer on the Burma list, were placed at the disposal of the Superintendent of Forest Surveys in Burma Government Notification No. 588—21 M., dated 17th December 1890. In addition to supervising the field work of the triangulating and traverse parties working in the Salween division, Mr. Hauxwell's task of keeping the several survey camps provided with supplies and coolie labour was by no means easy, and he carried out all he was expected to do most creditably. Mr. Hauxwell returned to forest duty at the close of the field season, and the technical or computing part of the season's work was done at Dehra Dun under Mr. Reynolds' supervision.

Mr. J. C. Kelly, Sub-Assistant Conservator of Forests.

86. Mr. Kelly, an officer of the executive staff of Assam forest Department, was attached to the Forest Survey Branch during the field season of 1890-91. He reported his arrival at Dhubri on the 30th November and joined the Goalpara detachment on the 4th December; he was employed throughout the season on traversing and in connecting the traversing with the triangulation. The 100 linear miles of traversing that he did was satisfactorily executed, but he failed to obtain an azimuth observation at the closing point of his work, which

ought to have been done, and regarding which orders had previously been issued by the Superintendent to the Officer in charge of the Goalpara party.

On the 20th June Mr. Kelly returned to forest duty.

As the forest survey work in the Goalpara district is now well advanced, Mr. Kelly's services will not be needed in the Survey Branch during the coming field season.

FOREST SURVEYORS.

Mr. T. S. Marten.

87. Mr. T. S. Marten was in charge of the forest survey detachment working in the Jubbulpore district from early in November to the beginning of June. He left Dehra on the 11th November and conducted field operations in the forests of the Sleemabad and Bijeraghogarh pergunnahs, and succeeded in completing the survey of the balance of the forest areas in the Jubbulpore district. He returned to head-quarters on the 8th of June, and during the recess season he was employed in drawing standard sheets of Bashahr as well as bringing up the office work of the Jubbulpore survey.

Mr. Marten's drawing in addition to being of a good quality was greatly in excess of his previous season's outturn, and his outturn of field work was also satisfactory.

Mr. James Marten.

88. Mr. James Marten was in charge of the Raipur detachment throughout the field season, or from the end of November to the end of July. He left Dehra on the 30th November and commenced field operations in the Sahawa pergunnah on the 21st December; his field work was confined chiefly to this pergunnah; he returned to head-quarters on the 28th July. During the recess months Mr. J. Marten was employed on drawing some of the standard sheets of Bashahr and in bringing up the office work of the Raipur party. He is an excellent draughtsman, and executed a good amount of hill-drawing, and also succeeded in turning out a very satisfactory amount of field work. He works cheerfully and well, and takes a great interest in all he has to do.

Mr. A. Descubes.

89. Mr. Descubes has throughout the year been employed at the head-quarters office, chiefly in posting up the provincial forest map records and in preparing special forest maps, and in working up forest area statements, as well as on other important miscellaneous work. He also supervises the work of the native assistants employed upon standard sheets, and during the Superintendent's absence on tour he takes charge of the head-quarters Drawing Office. His duties are quite as reponsible as the duties of Surveyors in charge of survey detachments, and he always performs them in a most cheerful, willing and satisfactory manner. He is a skilled draughtsman and a very deserving assistant.

Mr. J. H. Nichol.

90. Mr. Nichol was, throughout the field season, employed on triangulation; he left Dehra on the 15th November and commenced his field work on the 25th idem; his work was confined chiefly to the Partabgarh pergunnah of the Bhandara district; he returned to head-quarters on the 23rd April. He did a fair amount of triangulation but did not keep his vertical angle book as well as could be desired. He suffered a good deal from fever during the field season.

During the recess months Mr. Nichol was employed chiefly on computation and in preparing charts of triangulation.

Mr. C. Litchfield.

91. Mr. C. Litchfield was again employed on the 4-inch detail survey of the forests in the Bhandara district. He left Dehra on the 15th November and commenced his field work on the 27th idem; he suffered a good deal from fever during the field season. On closing the Bhandara work, on the 21st April, Mr. Litchfield proceeded to Bashahr and was employed from 28th May to the close of the year on the 1-inch survey of the Bashahr State. Mr. C. Litchfield is a very active and energetic assistant, and takes a great interest in his work; he succeeded in turning out a very satisfactory season's outturn of work, particularly in the higher Himalayas, where he had a most trying time of it. He is certainly deserving of advancement, but until he passes the departmental examination for the junior branch of the Survey of India Department there will be a difficulty about his promotion.

Sub-Surveyors.

Strength of Establishment.

92. The average strength of the Native establishment employed during the field season on each branch of work was—

Triangulation	1
Traversing	6
Plotting and computing	8
Plane-tabling	34
In the field	49
At head-quarters	21
TOTAL	70

Services of Native Establishment.

93. On the whole, the Native establishment worked cheerfully and well both in the field and in office; some of the Surveyors are excellent field hands and good draughtsmen.

The following Native assistants are deserving of mention for their steady and good work:—

Salig Ram	As a triangulator.
Badri Dutt	As a computor.
Bhup Singh	As good field surveyors and draughtsmen.
Oodey Singh	As good field surveyors and draughtsmen.
Suban Lal	As a plane-tabler.
Gunput Rai	As good draughtsmen.
Jadu Nath	As good draughtsmen.

Health of Establishment.

94. The establishment suffered a good deal from malarial or jungli fever during the field season; in Bhandara all the Surveyors suffered more or less, more particularly in the months of February and March; in the Raipur district fever was prevalent amongst the Surveyors in December and during the early part of January, but as the hot weather advanced, the health of the Raipur party improved; in the Jubbulpore district, although many of the men suffered from fever, none of them were incapacitated for lengthened periods; and in Assam the Goalpara establishment suffered a good deal from malarial fever during the latter months of the field season, so much so that several of the Native

Surveyors had to be sent to Dhubri for treatment, and were subsequently, before the close of the field season, sent on to Dehra as being unfit for farther field work. The Burma establishment suffered a good deal from fever in February and March, and one Indian khallassie died before the close of the field season. After the return of the party to head-quarters, we lost Singbir Singh, a Native Surveyor, who had been in the Forest Survey Branch for many years, and who succumbed to the fever which he contracted in the Burma forests.

Work done by the Survey of India Department for the Forest Survey Branch.

95. The forest survey maps continue to be photo-zincographed at the Office of the Trigonometrical Branch of the Survey of India Department, but the cost of this work is defrayed by the Forest Survey Branch.

The charges on account of work done by the Survey of India Department for the Forest Survey Branch for the year under report, including the cost of maps received from the Calcutta Office, amounted to R3,555.

Documents accompanying the Report.

96. The following documents are appended to this Report:—

1. Index Map to the Forest Survey of Bashahr, Punjab, scale 1″=4 miles.
2. Index Map to the Forest Survey of district Jubbulpore, Central Provinces, scale 8 miles = 1″.
3. Index Map to the Forest Survey of district Raipur, Central Provinces, scale 8 miles = 1″.
4. Index Map to the Forest Survey of district Bhandara, Central Provinces, scale 1″=4 miles.
5. Index Map to the Forest Survey of district Goalpara, Assam, scale 1″=4 miles.
6. Index Map to the Forest Survey of the East and West Salween Division and part of Attaram on the scale of 1″=8 miles.
7. Appendix A.—Summary of outturn of field work and computations.
8. Appendix B.—Summary of outturn of drawing and miscellaneous work.
9. Appendix C.—Summary of expenditure from the 1st October 1890 to 30th September 1891, showing the amount expended on field and office work.
10. Appendix D.—Area topographically surveyed by the Forest Survey Branch during 1890-91.
11. Annual Form No. 58.—Summary of revenue and expenditure during the financial year (Imperial).
12. Annual Form No. 58.—Summary of expenditure during the financial year.
13. Annual Form No. 59.—Account-current.
14. Annual Form No. 61.—Revenue received and outstanding on account of revenue.

DEHRA DUN;

The November 1891.

W. H. REYNOLDS,

Superintendent of Forest Surveys.

APPENDIX A.

Summary of Outturn of Field Work and Computations by the Forest Survey Department, from 1st October 1890 to 30th September 1891.

No.	North-Western Provinces, Punjab, Central Provinces, Assam, and Burma Surveys.		Amount.	Remarks.
	Plane-tabling.			
1	Area plane-tabled on the scale of 4″ = 1 mile—			
	(*a*) Bashahr—Punjab . . .	157·50		
	(*b*) Jubbulpore—Central Provinces .	138·00		
	(*c*) Raipur ,, ,, .	193·00		
	(*d*) Bhandara ,, ,, .	152·00		
	(*e*) Goalpara—Assam . . .	180·00		
		820·50		
	Area plane-tabled on the scale of 1″ = 1 mile—			
	Bashahr—Punjab	453		
	Area plane-tabled on the scale of 16″ = 1 mile—		1,381·50	square miles.
	(*a*) Jubbulpore—Central Provinces .	57·00		
	(*b*) Raipur ,, ,, . .	29·00		
	(*c*) Bhandara ,, ,, . .	22·00		
		108·00		
2	Boundary surveyed on 16″ scale (linear)—			
	(*a*) Jubbulpore—Central Provinces .	455		
	(*b*) Raipur ,, ,, . .	231	986	
	(*c*) Bhandara ,, ,, . .	300		
3	Boundary surveyed on 4″ scale—			
	(*a*) Morrah Forest—Central Circle, North-Western Provinces . .	19		
	(*b*) Bashahr—Punjab	45	165	
	(*c*) Goalpara—Assam	101		
	(*d*) Jubbulpore—Numbers added to forest boundary pillars on . .		25	linear miles.
4	Number of boundary pillars fixed—			
	(*a*) Morrah Forest, outer boundary—Central Circle, North-Western Provinces	69		
	(*b*) Morrah Forest, inner boundaries .	341	884	
	(*c*) Bashahr—Punjab	7		
	(*d*) Goalpara—Assam (outer boundary) .	182		
	(*e*) ,, class lines (inner boundary) .	285		

No.	North-Western Provinces, Punjab, Central Provinces, Assam, and Burma Surveys.		Amount.	Remarks.
	Triangulation.			
5	Area triangulated—			
	(*a*) Bashahr—Punjab	472	2,827	square miles.
	(*b*) Jubbulpore—Central Provinces . .	425		
	(*c*) Bhandara „ „ . . .	615		
	(*d*) Goalpara—Assam	1,106		
	(*e*) Tenasserim Circle—Burma . .	209		
6	Number of Theodolite stations—			
	(*a*) Bashahr—Punjab	40	203	
	(*b*) Jubbulpore—Central Provinces . .	74		
	(*c*) Bhandara—Central Provinces . .	32		
	(*d*) Goalpara—Assam	32		
	(*e*) Tenasserim Circle—Burma . . .	25		
7	Number of points fixed—			
	(*a*) Bashahr—Punjab	230	605	
	(*b*) Jubbulpore—Central Provinces . .	55		
	(*c*) Bhandara „ „ . .	160		
	(*d*) Goalpara—Assam	55		
	(*e*) Tenasserim Circle—Burma . . .	105		
8	Number of plane-table stations in area surveyed—			
	(*a*) Bashahr—Punjab	18,125	113,508	
	(*b*) Jubbulpore—Central Provinces . .	16,473		
	(*c*) Raipur „ „ . .	28,977		
	(*d*) Bhandara „ „ . .	31,512		
	(*e*) Goalpara—Assam	18,421		
9	Number of plane-table stations for testing work—			
	(*a*) Bashahr—Punjab	2,011	7,909	
	(*b*) Jubbulpore—Central Provinces . .	1,583		
	(*c*) Raipur „ „ . .	3,767		
	(*d*) Bhandara „ „ . .	548		

No.	North-Western Provinces, Punjab, Central Provinces, Assam, and Burma Surveys.		Amount.	Remarks.
	Traversing.			
10	Area traversed—			
	(*a*) Goalpara—Assam	61	246	square miles.
	(*b*) Tenasserim Circle—Burma . . .	185		
11	Number of linear miles traversed—			
	(*a*) Goalpara—Assam	146	281	
	(*b*) Tenasserim Circle—Burma . . .	135		
12	Number of traverse stations—			
	(*a*) Goalpara—Assam	907	3,903	
	(*b*) Tenasserim Circle—Burma . . .	2,996		
13	Check Surveys or "Partals"—			
	(*a*) Jubbulpore—Central Provinces . .	13	110	miles.
	(*b*) Raipur " " . .	79		
	(*c*) Bhandara " " . .	18		
	Computations.			
14	Number of linear miles of traversing—			
	(*a*) Goalpara—Assam	265	388¾	
	(*b*) Tennasserim Circle—Burma . . .	123¾		
15	Number of traverse stations in duplicate—			
	(*a*) Goalpara—Assam	1,472	4,307	
	(*b*) Tenasserim Circle—Burma . . .	2,835		
16	Number of triangles in duplicate—			
	(*a*) Bashahr—Punjab	321	1,087	
	(*b*) Jubbulpore—Central Provinces . .	59		
	(*c*) Bhandara " " . .	380		
	(*d*) Goalpara—Assam	166		
	(*e*) Tenasserim Circle—Burma . . .	161		

No.	North-Western Provinces, Punjab, Central Provinces, Assam, and Burma Surveys.		Amount.	Remarks.
17	Number of points fixed thereby, and of which the rectangular co-ordinates have been computed in duplicate—			
	(a) Bashahr—Punjab	175	559	
	(b) Jubbulpore—Central Provinces . .	34		
	(c) Bhandara " " . .	179		
	(d) Goalpara—Assam	83		
	(e) Tenasserim Circle—Burma . . .	88		
18	Number of triangles worked in duplicate to determine heights—			
	(a) Bashahr—Punjab	286	791	
	(b) Jubbulpore—Central Provinces . .	63		
	(c) Raipur " " . .	410		
	(d) Goalpara—Assam	32		
19	Number of points of which the heights were determined thereby—			
	(a) Bashahr—Punjab	143	376	
	(b) Jubbulpore—Central Provinces . .	32		
	(c) Bhandara " " . .	174		
	(d) Goalpara—Assam	27		
20	Abstract of horizontal angles in duplicate—			
	(a) Bashahr—Punjab	1,374	3,643	
	(b) Jubbulpore—Central Provinces . .	202		
	(c) Bhandara " " . .	1,082		
	(d) Goalpara—Assam	576		
	(e) Tenasserim Circle—Burma . . .	409		
21	Number of Great Trigonometrical stations computed in duplicate—			
	(a) Bashahr—Punjab	4	358	
	(b) Jubbulpore—Central Provinces . .	105		
	(c) Bhandara " " . .	87		
	(d) Raipur " " . .	42		
	(e) Tenesserim Circle—Burma . . .	120		

No.	North-Western Provinces, Punjab, Central Provinces, Assam, and Burma Surveys.		Amount.	Remarks.
22	Azimuth observations—			
	(a) Goalpara—Assam	3	5	stations.
	(b) Tenasserim Circle—Burma . . .	2		
23	Number of tangent scale clinometer observations—			
	(a) Bashahr—Punjab	2,073	4,856	
	(b) Jubbulpore—Central Provinces . .	824		
	(c) Raipur " " . .	322		
	(d) Bhandara " " . .	1,619		
	(e) Goalpara—Assam	18		
24	Number of heights determined by tangent scale clinometers—			
	(a) Bashahr—Punjab	729	2,135	
	(b) Jubbulpore—Central Provinces . .	456		
	(c) Raipur " " . .	161		
	(d) Bhandara " " . .	782		
	(e) Goalpara—Assam	7		
25	Number of Revenue Survey co-ordinates of Bhutan boundary pillars and of trijunction marks converted in terms of Forest Survey origin		54	

APPENDIX B.

Summary of Outturn of Drawing executed by the Forest Survey Branch, from 1st October 1890 to 30th September 1891.

No.	Particulars.	Number of sheets.	Remarks.
	Original Drawings.		
	NORTH-WESTERN PROVINCES AND OUDH.		
	Central Circle.		
1	Kumaun and Garhwal Sheets, scale 4″=1 mile, No. LII (redrawn with additions) (published).	1	
2	Kumaun and Garhwal Sheets, No. LIII, LIIIA, LIVA, scale 4″=1 mile (sent to press).	3	
3	Kamaun and Garhwal, part of Sheet No. LX, scale 4″=1 mile (sent to press).	1	
4	Kumaun and Garhwal No. LIV,* scale 4″=1 mile (redrawn with additions) (in progress).	1	
5	Map of the Reserved and Protected Forests of the Ganges, Garhwal, Naini Tal, and Kumaun Divisions, scale 1″=4 miles (published).	1	
	School Circle.		
6	Map of the Korwa Forests situated in the Bamtar Khat, Jaunsar Division, scale 12″=1 mile (published).	1	
7	Map of the Karamba block, part of Karamba Forest, Jaunsar Division, Nos. 223 and 227, North-Western Provinces and Oudh, scale 4″=1 mile (sent to press).	1	
8	Map of the Government Forests of Tiri Garhwal in Jaunsar, scale 4″=1 mile, Nos. 333 S. E./2, 348 S.E./1, 348 S. W./2, 34 S. W/1 (sent to press).	4	
9	Map of the Government Forests of Tiri Garhwal in Jaunsar, scale 4″=1 mile, No. 333* N. E./4 (in progress).	1	
	Oudh Circle.		
10	Map of the Reserved Forests in Districts Kheri and Pilibhit, scale 4 miles = 1″ (published).	1	
	Punjab.		
11	Map of the Government Forest in the Districts of Simla, Punjab scale 4″=1 mile, Sheet No. 332 N. W./3 (published).	1	
12	Map of the Government Forest in the Districts of Simla, Punjab, scale 4″=1 mile, Sheet Nos. 332 S. W./2, 332 N W./2, 332 S. W./3, 332 N. W./4, 346 S W./1, 346 S. E./1, 346 S. W./3, 347 N. E./1, 347 N. W./2, 352 S. W./1 (sent to press).	10	
13	Map of the Government Forest in the Districts of Simla, Punjab, scale 4″=1 mile, Sheets Nos. 346 S. E./3, 346 S. W./4 (2nd edition) (sent to press).	2	

* Reported in 1889-90 as being in progress.

No.	Particulars.	Number of sheets.	Remarks.
14	Map of the Government Forest in the Districts of Simla, Punjab, scale 4″=1 mile, Sheets Nos. 331*$\frac{S.E.}{4}$, 332*$\frac{S.E.}{1}$, 332*$\frac{S.W.}{1}$, 332$\frac{S.W.}{4}$, 333*$\frac{N.W.}{1}$, 333$\frac{N.W.}{2}$, 346*$\frac{S.E.}{2}$, 346*$\frac{N.E.}{3}$, 346*$\frac{N.E.}{4}$, 346$\frac{S.E.}{4}$, 347*$\frac{N.W.}{1}$, 347*$\frac{N.E.}{3}$, 347*$\frac{N.W.}{4}$, 347$\frac{N.E.}{4}$, 348$\frac{N.W.}{3}$, (in progress).	15	
15	Chart of Bashahr Triangulation, Nos. 331*, 332*, 333*, 348,* scale 1″=1 mile (in progress).	4	
16	Map of the Leased Forests in the Chamba State, showing Forests of Banikhet, Surkhigalli, Dadra, and Kalatop, scale 2″=1 mile (published).	1	
17	Map of part of the Chamba Territory showing the Leased Forests, with boundary of ranges and blocks, scale 1″=2 miles, in 2 sheets (published).	1	
	Assam.		
18	Index Map to the Forest Survey of District Goalpara, scale 1″=4 miles (published).	1	
19	Map of Darugiri, Western Circle, Garo Hills Division, scale 4 miles =1″ (sent to Press).	1	
	Bengal		
20	Map of the Government Forests in the Chota Nagpur Division, Singhboom, scale 4″=1 mile, Sheets Nos. 125$\frac{S.E.}{1 \text{ and } 3}$, 125$\frac{S.E.}{2 \text{ and } 4}$, 126$\frac{S.E.}{1}$, 126$\frac{N.E.}{1}$, 126$\frac{S.E.}{2}$, 126$\frac{N.E.}{2}$, 126$\frac{N.W.}{2}$, 126$\frac{S.W.}{2}$, 126$\frac{N.E.}{3}$, 126$\frac{N.W.}{4}$, 126$\frac{N.E.}{4}$, 127$\frac{S.W.}{4}$, 157$\frac{N.W.}{3}$ (published).	13	
	Berar.		
21	Map of the Melghat Taluk, District Ellichpur, Berar, scale 4″=1 mile, Sheet No. 14$\frac{N.W.}{3}$, Bhingara Jagir (published).	1	
22	Map of the Melghat Taluk, District Ellichpur, Berar, Sheets Nos. 14 N. E. in two sections and 20 A. N. W. in two sections, scale 4″=1 mile (published).	4	
23	Map of the Melghat Taluk, District Ellichpur, Berar, Sheets Nos. 13 S. E., 14 N. E., $\frac{13 \text{ and } 14}{S.W. \text{ and } N.W.}$, 19 N. W., S. W., 20 A. N. W., scale 2″=1 mile (published).	5	
24	Map of the Melghat Taluk, District Ellichpur, Berar, Sheets Nos. 19$\frac{N.E.}{1}$, 19$\frac{S.W.}{1}$, 19$\frac{N.W.}{2}$, 19$\frac{S.W.}{3}$, 19$\frac{N.E.}{2}$, 19$\frac{N.W.}{3}$, 20$\frac{N.W.}{2}$, 26$\frac{S.W.}{1}$, 26$\frac{N.W.}{1}$, 26$\frac{N.W.}{3}$, scale 4″=1 mile, reduced in ½ scale (2″=1 mile) (published).	10	
	Central Provinces.		
	Jubbulpore.		
25	Map of the Government Forests in the Jubbulpore Division, part of Jubbulpore Range, scale 4″=1 mile, Sheets Nos. 107$\frac{S.E.}{1}$, 107$\frac{S.W.}{1 \text{ and } 2}$, 107$\frac{S.E.}{2}$ and $\frac{N.E.}{4}$, 107$\frac{S.W.}{3}$, 107$\frac{S.E.}{3}$, 107$\frac{S.W.}{4}$, 108$\frac{N.W.}{1}$, 108$\frac{N.W.}{2}$, 108$\frac{N.W.}{3}$, 108$\frac{N.W.}{4}$, 130$\frac{S.W.}{3}$ (sent to press).	11	

* Reported in 1889-90 as being in progress.

No.	Particulars.	Number of sheets.	Remarks.
26	Map of the Government Forests in the Jubbulpore Division, part of Jubbulpore Range, scale 4″=1 mile, Sheets Nos. 86 S.E./3, 86 S.W./4, 87 N.E./1, 87 N.W./2, 87 N.W./4, 107 N.W./2, 108 N.E./1 (in progress).	7	
	Raipur.		
27	Map of the Government Forests in the District of Raipur, scale 4″=1 mile, Sheets Nos. 187 N.E./1, 187 S.W./1, 187* S.W./3, 187 S.W./4, 208 N.W./1, 208 N.W./3 (in progress).	6	
	Chanda.		
28	Map of the Government Forests in the District of Chanda, scale 4″=1 mile, Sheets Nos. 122 S.W./3 and 4, 122 N.W./4 and S.W./2, 123* N.W./1 and 2, 123* S.W./1 and 2, 123 N.W./3 and 4, 123* S.W./3 and 4, (in progress).	6	
	Bhandara.		
29	Index Map to the Forest Survey of District Bhandara, scale 4 miles =1″, reduced to 8 miles =1″ (published).	1	
30	Map of the Government Forests in the District Bhandara, scale 4″ = 1 mile, Sheets Nos. 92 S.E./1, 92 S.E./2, 92 N.E./2, 92 S.E./3, 92 N.E./3, 92 N.E./4 (in progress).	6	
	BURMA.		
	Pegu Circle.		
31	Map of the Forests of Kadin Bilin, Kon Bilin, Minhla, Shwele, Mokka, Thonze, Gamon, Baw Bin, and Taungnyo Working Circles, scale 1″=1 mile (published).	9	
	Tenasserim Circle.		
32	Index Map to the Forest Survey in the east and west of Salween and part of Attaram Division, scale 1″=8 miles (published).	1	
	UPPER BURMA.		
33	Map of the Sareikta, Nankyita and Nanbyan Forests, Kawbin Range, Ye-u and Wuntho Districts, scale 1″=1 mile (published).	1	
34	Map of the Taungdwin Reserve with parts of Mingin, Kani and Se-Yau Gyaung, scale 1″=1 mile (published).	1	
35	Map of the Kindat Reserve, Chindwin Division, scale 1″=1 (published).	1	
36	Map of Mon West proposed reserve, Mimbu District, scale 1″=1 mile (sent to press).	1	
37	Map of Nwamadaung proposed reserve, Mimbu District, scale 1″=1 mile (sent to press).	1	
38	Map of Mimbu Division Forests, containing Yebé, Kyaukmygaung, Kinmuntaung, Yinmele, Ngamin, Sâdon, Sun, in two sections, scale 1″=1 mile (in progress).	2	

* Reported in 1889-90 as being in progress.

No.	Particulars.	Number of sheets.	Remarks.
	Tracings made.		
39	Tracings made for various Forest and District Officers .	127	
	Map-colouring.		
40	Printed Map of various kinds coloured . . .	1,345	
	Mounted Maps.		
41	Printed Maps, mounted in book form	921	
42	Computation volumes and other books bound . .	207	

APPENDIX C.

Summary of Expenditure from 1st October 1890 to 30th September 1891, showing the amounts expended in the Field and Office Works of the Forest Surveys (Imperial).

No.	Months.	North-Western Provinces and Oudh. Central Circle. Kumaun and Naini Tal. Field.	Office.	School Circle. Tehri-Garhwal and Jaunsar. Office.	Korwa. Office.	General.	Saharanpur. Field.	Punjab. Bahawalpur. Field.	Office.	General.	Bengal. Singhbhoom. Office.	General.	Central Provinces. Jubbulpore. Field.	Office.	General.	Raipur. Field.	Office.	General.	Chanda. Office.	Bhandara. Field.	Office.	General.	Berar. Melghat. Office.	General.	Assam. Goalpara. Field.	Office.	General.	Burma. Tenasserim Circle. Field.	Office.	General.	Imperial Head-Quarters.	Grand Total.	Remarks.
		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
1	October 1890	..	...	...	...	..	...	3,210	130	564	...	...	...	365	157	..	...	224	...	..	..	281	105	203	...	90	179	...	..	...	4,687	10,195	
2	November ,,	...	...	..	4	...	158	1,902	108	420	14	...		207	55	207	14	536	58	...	27	69	55		..	16	50	...	..	...	3,005	6,905	
3	December ,,	...	...	...	...	...	..	1,811	134	100	15	...	527	44	618	...	6	327	60	430	13	634	122	...	100	...	713	...	16	327	1,753	7,780	
4	January 1891	...	...	40	...	...	...	309	217	112	.	...	819	55	476	265	...	287	80	1,160	.	475	41	...	...	...	1,282	335	..	5,280	1,335	12,568	
5	February ,,	...	62	...	...	...	...	196	201	..	...	...	1,101	32	129	.	20	169	88	1,080	.	110	...	455	2,457	...	1,363	...	...	883	1,300	9,646	
6	March ,,	...	...	70	...	48	...	11	232	...	...	249	1,101	14	100	1,963	.	734	80	1,233	...	294	...		3,275	342	714	2,035	...	367	1,889	14,771	
7	April ,,			...	...	...	...	...	152	296	...	..	9	53	100	846	20	100	70	989	48	186	...	518	600	...	..	234	..	823	1,659	6,703	
8	May ,,	72	11	40	...	...	...	159	233	261	...	160	1,621	10	104	693	...	118	...	719	45	210	10	..	1,933	210	120	616	23	151	1,593	9,112	
9	June ,,	17	...	..	...	...	...	1,114	167	782	...	642	662	12	77	.	10	50	...	70	136	50	...	..	300	44	573	.	48	...	1,429	6,183	
10	July ,,	..	...	...	...	...	...	1,266	388	261	...	.	172	29	283	...	6	50	...	267	129	168	...	88	3,981	74	2,467	...	51	49	1,568	11,297	
11	August ,,	...	...	...	...	...	...	992	449	1,026	...	...	...	17	164	1,769	...	632	...	...	16	162	...	219	...	30		...	38	.	3,620	9,134	
12	September ,,	...	...	...	...	...	...	1,213	411	429	...	...	...	256	93	...	127	96	...	...	4	98	...	...	52	141	80	10	133	52	2,675	5,870	
	Total	89	73	150	4	48	158	12,213	2,822	4,251	29	1,051	6,012	1,094	2,356	5,763	203	3,323	436	5,948	418	2,737	333	1,483	12,698	947	7,541	3,230	309	7,932	26,513	1,10,164	
		162		150	52		158	19,286			1,080		9,462			9,289			436	9,103			1,816		21,186			11,471			26,513	1,10,164	
		522						19,286			1,080		28,290										1,816		21,186			11,471			26,513	1,10,164	

APPENDIX D.

Area topographically surveyed by the Forest Survey Department during 1890-91.

No.	Province and District.		Area in square miles.			Remarks.
			Demarcated Forests.	Other lands.	Total.	
1	Central Provinces	Jubbulpore	195	...	195	
		Raipur	222	...	222	
		Bhandara	174	...	174	
2	Punjab—Bashahr		157·50	453	610·50	All forests in Bashahr, whether demarcated or not, are held in lease by the Punjab Government.
3	Assam—Goalpara		180	...	180	
	Total		928·50	453	1381·50	

ANNUAL FORM No. 58 (*Prescribed.*)

Forest Department, India, Forest Surveys.

Summary of Revenue of the different Divisions during 1890-91.

Receipts.

	R	a.	p.
I.—Timber and other produce removed from the Forests by Government Agency—			
a. Timber	...		
b. Firewood and charcoal	...		
c. Bamboos	...		
d. Sandal-wood	...		
e. Grass and other minor produce	...		
II.—Timber and other produce removed from the Forests by Consumers or Purchasers—			
a. Timber	...		
b. Firewood and charcoal	...		
c. Bamboos	...		
d. Grazing and fodder grass	...		
e. Other minor produce	...		
III.—Drift and Waif Wood and Confiscated Forest Produce	...		
IV.—Revenue from Forests not managed by Government—			
a. Duty on foreign timber and other forest produce	...		
b. Revenue from shared and private forests	...		
V.—Miscellaneous—			
a. Fines and forfeitures	...		
b. Refunds	1,144	4	10
c. Other sources	959	12	8
Total	2,104	1	6

ANNUAL FORM No. 58—*continued.*

FOREST DEPARTMENT, INDIA, FOREST SURVEYS.

Summary of Expenditure of the different Divisions during 1890-91.

Expenditure.

A.—CONSERVANCY AND WORKS.	R	a.	p.
I.—Timber and other Produce removed from the Forests by Government Agency—			
a. Timber	...		
b. Firewood and Charcoal	...		
c. Bamboos	...		
d. Sandal-wood	...		
e. Grass and other Minor Produce	...		
II.—Timber and other Produce removed from the Forests by Consumers or Purchasers	...		
III.—Drift and waif wood and confiscated Forest Produce—			
IV.—Revenue from Forests not managed by Government—			
a. Duty on foreign timber and other forest produce	...		
b. Revenue from Shared and Private Forests	...		
V.—Rent of Leased Forests and payments to Shareholders in Forests managed by Government	...		
VI.—Live Stock, Stores, Tools and Plant—			
a. Purchase of Cattle	...		
b. Feed and keep of Cattle	0	15	9
c. Purchase of Stores, Tools and Plant	1,620	4	0
VII.—Communications and Buildings—			
a. Roads and Bridges	...		
b. Buildings	...		
c. Other Works	...		
VIII.—Demarcation, Improvement and Extension of Forests—			
a. Demarcation	...		
b. Compensation for Land and Rights	...		
c. Surveys and Working Plans	504	78	
d. Sowing and Planting	...		
e. Protection from Fire	...		
f. Other Works	...		
IX.—Miscellaneous—			
a Refunds	...		
b. Law Charges	...		
c. Other Charges	3	0	2
TOTAL A.—CONSERVANCY AND WORKS	7,428	12	6

Vide Comptroller General's telegram, dated 20th July 1891.

B.—ESTABLISHMENT.			
I.—Salaries—			
a. Conservators	...		
b. Superior Officers	7,198	15	1
c. Upper Subordinate Establishments	...		
d. Lower Subordinate Establishments	5,804	11	0
e. Deputation and Special Allowances	...		
Carried over	13,003	10	1

ANNUAL FORM No. 58—*continued.*

FOREST DEPARTMENT, INDIA FOREST SURVEYS.

Summary of Expenditure of the different Divisions during 1890-91.

B.—ESTABLISHMENTS—*continued.*	R	a.	p.
Brought forward .	13,003	10	1
II.—Travelling Allowances—			
a. Conservators	...		
b. Superior Officers	—0	6	0
c. Upper Subordinate Establishments	—0	2	0
d. Lower " "	446	6	9
III.—Contingencies—			
a. Stationery	...		
b. Carriage of Tents and Records	154	5	4
c. Rents, Rates and Taxes	965	0	0
d. Pay of Police Guards	...		
e. Official Postage	457	15	6
f. Sundries	1,868	3	6
TOTAL B.—ESTABLISHMENTS . .	16,895	1	2
Grand Total of Expenditure .	**24,323**	**13**	**8**

A.—CONSERVANCY AND WORKS.			
I.—Timber and other produce removed from the Forests by Government Agency—			
a. Timber	...		
b. Firewood and Charcoal	...		
c. Bamboos	...		
d. Sandal-wood	...		
e. Grass and other Minor Produce	...		
II.—Timber and other Produce removed from the Forests by Consumers or Purchasers	...		
III.—Drift and Waif Wood and Confiscated Forest Produce .	...		
IV.—Revenue from Forests not managed by Government—			
a. Duty on foreign timber and other forest produce .	...		
b. Revenue from Shared and Private Forests . .	...		
V.—Rent of Leased Forests and payments to Shareholders in Forests managed by Government	...		
VI.—Live Stock, Stores, Tools and Plant—			
a. Purchase of Cattle	...		
b. Feed and keep of Cattle	2,576	2	1
c. Purchase of Stores, Tools and Plant . .	6,809	11	0
VII.—Communications and Buildings—			
a. Roads and Bridges	...		
b. Buildings	...		
c. Other Works	...		
VIII.—Demarcation, Improvement and Extension of Forests—			
a. Demarcation	...		
b. Compensation for Land and Rights	...		
c. Surveys and Working Plans	26,746	14	1
d. Sowing and Planting	...		
e. Protection from Fire	...		
f. Other Works	...		
IX.—Miscellaneous—			
a. Refunds	...		
b. Law Charges	.		
c. Other Charges	...		
TOTAL A.—CONSERVANCY AND WORKS .	36,132	11	2

ANNUAL FORM No. 58—*concluded.*

Forest Department, India, Forest Surveys.

Summary of Expenditure of the different Divisions during 1890-91.

B.—Establishment.	R	a.	p.
Brought forward,—Total A.—Conservancy and Works .	36,132	11	2
I.—Salaries—			
a. Conservators	...		
b. Superior Officers	17,704	8	9
c. Subordinate Forest and Depôt Establishments . .	8,640	0	0
d. Office establishments	14,964	5	11
e. Deputation and Special Allowances . . .	205	5	4
II.—Travelling Allowances—			
a. Conservators	...		
b. Superior Officers	4,738	11	1
c. Subordinate Forest and Depôt Establishments . .	6,542	11	0
d. Office Establishments	8,276	3	6
III.—Contingencies—			
a. Stationery	...		
b. Carriage of Tents and Records	1,478	1	10
c. Rents, Rates and Taxes	1,071	11	10
d. Pay of Police Guards	...		
e. Official Postage	557	13	0
f. Sundries	2,682	7	11
Total B—Establishments .	66,862	0	2
Grand Total of Expenditure .	1,02,994	11	4

ANNUAL FORM No. 59.

Account-Current for the year 1890-91.

Dr.

	R a. p.	R a. p
To Cash Balance . .	.. ..	
To VIII —Assessed Taxes— Income-tax—Deductions from salaries .	.....	827 6 10
To Revenue, as per Annual Summary Form No 58	.. ...	2,104 1 6
To Service Funds—		
Civil Fund—Ordinary, Bengal .	.. ..	.....
Civil Fund—Additional, Bengal .	.... .	. ...
Military Fund—Bengal	.....	. .. .
Military Fund—Madras	.....	.... .
Military Orphan Fund—Bengal .	.....	.....
Uncovenanted Service Family Pension Fund, Bengal . . .	452 0 0	452 0 0
General Family Pension Fund . .	.....	... .
Hindu Family Annuity Fund . .	.. ...	.....
To Deposits . . .	. ...	... ..
To Forest Cash Remittances—Local—		
Forest cheques drawn .	508 1 8	.....
Inter-Divisional Transfers . .	.....	508 1 8
To Advances recoverable .	.....	90,830 14 6
To Suspense . .	.....	35 3 1
To Account Current (other Governments)—		
Remittances from Government of Assam	7,587 8 0	.....
Remittances from Government of North-Western Provinces and Oudh .	59,009 3 9	... ..
Remittances from Government of Central Provinces . .	15,141 7 7	.....
Remittances from Government of Punjab	10,694 11 9	.....
Remittances from Government of Burma .	4,450 0 0	.....
		96,882 15 1
To Inter-Departmental Transfers—		
Public Works Department . .	... ..	.....
Military Department .	.. ..	.....
Civil Department—		
Survey of India	5,837 15 0	.....
Mathematical Instrument Department .	5,529 0 0	.....
		11,366 15 0
TOTAL .	..	2,03,007 9 8

Cr.

	R a p	R a p
By Expenditure as per Annual Summary Form No. 58 . . .	.....	24,323 13 8
By Deposits . . .	.....	.....
By Forest Cash Remittances—Local—		
Remittances to Treasuries . .	1 12 0	.....
Inter-Divisional Transfers . . .	... ..	.... .
		1 12 0
By Advances Recoverable	.....	94,616 4 9
By Suspense . . .	.....	38 14 1
By Account Current (other Governments)—		
Remittances to the Government of Burma .	9,243 0 0	.....
Remittances to the Government of Punjab .	21,006 0 0	.....
Remittances to the Government of North-Western Provinces and Oudh . . .	2,187 3 6	.....
Remittances to the Government of Assam .	18,674 13 10	.....
Remittances to the Government of Central Provinces . . .	27,624 1 10	.....
Remittances to the Government of Bengal .	306 0 0	.....
		79,041 3 2
By Account Current with Foreign States—		
Berar Suspense Account	.....	4,266 0 0
Inter-Departmental Transfers—		
Military Department	... ..	.....
Civil Department .	.....	.....
Mathematical Instrument Department .	719 10 0	.....
		719 10 0
By Cash Balance . .	.....	.....
TOTAL .	... ..	2,03,007 9 8

ANNUAL FORM No. 61.

OUTSTANDINGS AND LIABILITIES ON ACCOUNT OF CONTRACTORS AND DISBURSERS FOR 1890-91.

Division	Department Debtor			Department Creditor.			Balance Due.	
	At commencement of year	Recoveries in cash and value of supplies and work done during the year.	At close of year	At commencement of year	Payments made during year	At close of year	To Department (Outstandings)	By Department (Liabilities)
		R a p	R a p	R a p.	R a p	R a p	R a p	
Forest Surveys . . .	.	90 830 14 6	90,830 14 6	4,645 9 1	94,616 4 9	99,261 13 10	8,430 15 4	...

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